

CLAIMS

1. A method of conditioning a keratinous material comprising:

applying a composition comprising at least one carboxylic acid or a salt thereof chosen from the compound of formula (I) or (II):



wherein

- $R^1$  represents a  $CH_2OH$  or  $CO_2X$  group,
- $X$  represents a hydrogen atom or a monovalent or divalent cation derived from a transition metal, alkali metal, alkaline-earth metal, organic amine or ammonium ion,
- $R^2$  represents a hydrogen atom or a  $-CH(COOX) - (CH_2)_2COOX$ ,  $-CH_2CH_2OH$ ,  $-CH(CH_3) - COOX$  or  $-(CH_2)_2 - N(COR") - CH_2 - COOX$  group,
- $R''$  represents a linear or branched alkyl group containing from 1 to 30 carbon atoms or a cyclic alkyl group containing from 3 to 30 carbon atoms, and
- $R'$  represents either a  $-CH_2 - COOX$  group when  $R^2$  is a hydrogen atom or a hydrogen atom when  $R^2$  is other than a hydrogen atom,  
to said keratinous material.

2. The method of claim 1, wherein said keratinous material is a keratinous fiber.

3. The method of claim 2, wherein said keratinous material is hair.

4. The method of claim 1, wherein said monovalent or said divalent cation is an alkali metal cation, an alkaline-earth metal cation or a divalent transition metal cation.

5. The method of claim 1, wherein said compound of formula (I) is gluconic acid, an alkali metal salt thereof, an alkaline-earth metal salt thereof, a transition metal salt thereof, or a mixture thereof.

6. The method of claim 5, wherein said compound of formula (I) is gluconic acid, sodium gluconate, potassium gluconate, anhydrous calcium gluconate, calcium gluconate monohydrate, calcium borogluconate, magnesium gluconate, iron gluconate, manganese gluconate, zinc gluconate or copper gluconate.

7. The method of claim 1, wherein when R<sup>1</sup> is a CH<sub>2</sub>OH group, said compound of formula (I) is gluconic acid, an alkali metal salt thereof, an alkaline-earth metal salt thereof, a transition metal salt thereof, or a mixture thereof.

8. The method of claim 1, wherein said compound of formula (I) is mucic acid, glucaric acid, mannaric acid, or an alkali metal salt thereof, an alkaline-earth metal salt thereof, a transition metal salt thereof, or a mixture thereof.

9. The method of claim 1, wherein when R<sub>1</sub> is a CO<sub>2</sub>X group, said compound of formula (I) is mucic acid, glucaric acid, mannaric acid, or an alkali metal salt thereof, an alkaline-earth metal salt thereof, a transition metal salt thereof, or a mixture thereof.

10. The method of claim 1, wherein said compound of formula (I) is gluconic acid or mucic acid.

11. The method of claim 1, wherein said compound of formula (II) is methylglycinediacetic acid, 2-hydroxyethyliminodiacetic acid, N-lauroyl-N,N',N'-ethylenediaminetriacetic acid, iminodisuccinic acid, N,N-dicarboxymethyl-L-glutamic acid or the corresponding salt thereof or a mixture thereof.

12. The method of claim 11, wherein said compound of formula (II) is methylglycinediacetic acid, optionally in a salt form.

13. The method of claim 11, wherein said compound of formula (II) is 2-hydroxyethyliminodiacetic acid, optionally in a salt form.

14. The method of claim 11, wherein said compound of formula (II) is iminodisuccinic acid, optionally in a salt form.

15. The method of claim 1, wherein content of said compound of formula (I) or (II) is from 0.001% to 10% by weight relative to the total weight of the composition.

16. The method of claim 15, wherein said content of said compound of formula (I) or (II) is from 0.001% to 5% by weight relative to the total weight of the composition.

17. The method of claim 1, further comprising a cosmetic additive chosen from a fatty substance, organic solvent, silicone, thickener, softener, surfactant, anionic, cationic, nonionic or amphoteric polymer, antifoam, protein, vitamin, agent for preventing hair loss, antidandruff agent, dye, fragrance, preserving agent or propellant.

18. The method as in claim 1 or 17, wherein said composition is a shampoo, rinse-out or leave-in conditioning agent, composition for permanent-waving, relaxing, dyeing or bleaching the hair or rinse-out composition to be applied before or after dyeing, permanent-waving or relaxing the hair or between the two steps of permanent-waving or hair-relaxing operation.

19. The method of improving disentangling, softness or sheen of a keratinous material comprising:

applying a composition comprising at least one carboxylic acid or a salt thereof chosen from the compound of formula (I) or (II):





wherein

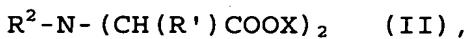
- $R^1$  represents a  $CH_2OH$  or  $CO_2X$  group,
- $X$  represents a hydrogen atom or a monovalent or divalent cation derived from a transition metal, alkali metal, alkaline-earth metal, organic amine or from ammonium ion,
- $R^2$  represents a hydrogen atom or a  $-CH(COOX)-(CH_2)_2COOX$ ,  $-CH_2CH_2OH$ ,  $-CH(CH_3)-COOX$  or  $-(CH_2)_2-N(COR'')-CH_2-COOX$  group,
- $R''$  represents a linear or branched alkyl group containing from 1 to 30 carbon atoms or a cyclic alkyl group containing from 3 to 30 carbon atoms, and
- $R'$  represents either a  $-CH_2-COOX$  group when  $R^2$  is a hydrogen atom, or a hydrogen atom when  $R^2$  is other than a hydrogen atom  
to said keratinous material.

20. The method of claim 19, wherein said keratinous material is a keratinous fiber.

21. The method of claim 20, wherein said keratinous material is hair.

22. A method of conditioning a keratinous material comprising:

dispensing a composition comprising at least one carboxylic acid or a salt thereof chosen from the compound of formula (I) or (II):



wherein

- $R^1$  represents a  $CH_2OH$  or  $CO_2X$  group,
- $X$  represents a hydrogen atom or a monovalent or divalent cation derived from a transition metal,

alkali metal, alkaline-earth metal, organic amine or ammonium ion,

- R<sup>2</sup> represents a hydrogen atom or a -CH(COOX)- (CH<sub>2</sub>)<sub>2</sub>COOX, -CH<sub>2</sub>CH<sub>2</sub>OH, -CH(CH<sub>3</sub>) -COOX or -(CH<sub>2</sub>)<sub>2</sub>- N(COR") -CH<sub>2</sub>-COOX group,
- R" represents a linear or branched alkyl group containing from 1 to 30 carbon atoms or a cyclic alkyl group containing from 3 to 30 carbon atoms, and
- R' represents either a -CH<sub>2</sub>-COOX group when R<sup>2</sup> is a hydrogen atom or a hydrogen atom when R<sup>2</sup> is other than a hydrogen atom,  
and then applying said composition to said keratinous material.

23. A method as in claim 1, 19 or 22, further comprising rinsing said composition from said keratinous material with water.

24. A product for application to hair comprising:  
at least one carboxylic acid or a salt thereof chosen from the compound of formula (I) or (II):



wherein

- R<sup>1</sup> represents a CH<sub>2</sub>OH or CO<sub>2</sub>X group,
- X represents a hydrogen atom or a monovalent or divalent cation derived from a transition metal, alkali metal, alkaline-earth metal, organic amine or from ammonium ion,
- R<sup>2</sup> represents a hydrogen atom or a -CH(COOX)- (CH<sub>2</sub>)<sub>2</sub>COOX, -CH<sub>2</sub>CH<sub>2</sub>OH, -CH(CH<sub>3</sub>) -COOX or -(CH<sub>2</sub>)<sub>2</sub>- N(COR") -CH<sub>2</sub>-COOX group;
- R" represents a linear or branched alkyl group containing from 1 to 30 carbon atoms or a cyclic

alkyl group containing from 3 to 30 carbon atoms; and

- R' represents either a -CH<sub>2</sub>-COOX group when R<sup>2</sup> is a hydrogen atom, or a hydrogen atom when R<sup>2</sup> is other than a hydrogen atom,

formulated as a shampoo, rinse-out or leave-in conditioning agent, composition for permanent-waving, relaxing, dyeing or bleaching the hair or rinse-out composition to be applied before or after dyeing, permanent-waving or relaxing the hair or between the two steps of permanent-waving or hair-relaxing operation.

25. The product for application for hair of claim 24, further comprising a cosmetic additive chosen from a fatty substance, organic solvent, silicone, thickener, softener, surfactant, anionic, cationic, nonionic or amphoteric polymer, antifoam, protein, vitamin, agent for preventing hair loss, antidandruff agent, dye, fragrance, preserving agent or propellant.